

Title (en)
MODEL-BASED IMAGE RECONSTRUCTION METHOD

Title (de)
MODELLBASIERTES BILDREKONSTRUKTIONSVERFAHREN

Title (fr)
PROCÉDÉ DE RECONSTRUCTION D'IMAGE BASÉE SUR UN MODÈLE

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Application
EP 17187412 A 20170823

Priority
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Abstract (en)
The present invention concerns a pulse wave image reconstruction method to be used for example in ultrasound imaging. The proposed method is based on an image measurement model and its adjoint operator. The proposed method introduces matrix-free formulations of the measurement model and its adjoint operator. The proposed method has the advantage that the reconstructed image has a very high quality and that it can be reconstructed quickly.

IPC 8 full level
G01S 7/52 (2006.01); **G01S 7/285** (2006.01); **G01S 7/48** (2006.01); **G01S 7/486** (2020.01); **G01S 15/89** (2006.01); **G10K 11/34** (2006.01)

CPC (source: EP IL KR US)
G01S 7/285 (2013.01 - EP IL KR); **G01S 7/4802** (2013.01 - EP IL KR); **G01S 7/486** (2013.01 - EP IL KR); **G01S 7/52028** (2013.01 - EP IL KR US); **G01S 7/52085** (2013.01 - US); **G01S 15/8915** (2013.01 - EP IL KR US); **G01S 15/8977** (2013.01 - EP IL KR US)

Citation (applicant)
• G. E. TUPHOLME: "Generation of acoustic pulses by baffled plane pistons", MATHEMATIKA, vol. 16, 1969, pages 209
• P. R. STEPANISHEN: "The Time-Dependent Force and Radiation Impedance on a Piston in a Rigid Infinite Planar Baffle", J. ACOUST. SOC. AM., vol. 49, 1971, pages 76
• P. THEVENAZ; T. BLU; M. UNSER: "Interpolation revisited", IEEE TRANSACTIONS ON MEDICAL IMAGING, vol. 19, 2000, pages 739 - 758, XP002244089, DOI: doi:10.1109/42.875199
• P. COMBETTES; J.-C. PESQUET: "Proximal Splitting Methods in Signal Processing", FIXED-POINT ALGORITHMS FOR INVERSE PROBLEMS IN SCIENCE AND ENGINEERING, 2011, pages 185 - 212
• A. BECK; M. TEOULLE: "A Fast Iterative Shrinkage-Thresholding Algorithm for Linear Inverse Problems", SIAM JOURNAL ON IMAGING SCIENCE, vol. 2, 2009, pages 183 - 202, XP009167765, DOI: doi:10.1137/080716542
• S. BOYD; N. PARIKH; E. CHU; B. PELEATO; J. ECKSTEIN: "Distributed Optimization and Statistical Learning via the Alternating Direction Method of Multipliers", FOUNDATIONS AND TRENDS IN MACHINE LEARNING, vol. 3, 2011, pages 1 - 122, XP055127725, DOI: doi:10.1561/22000000016
• P. COMBETTES; L. CONDAT; J.-C. PESQUET; BC VU: "A forward-backward view of some primal-dual optimization methods in image recovery", PROCEEDINGS OF THE 2014 IEEE INTERNATIONAL CONFERENCE ON IMAGE PROCESSING, 2014, pages 4141 - 4145, XP032967409, DOI: doi:10.1109/ICIP.2014.7025841
• N. PUSTELNIK; C. CHAUX; J.-C. PESQUET: "Parallel Proximal Algorithm for Image Restoration Using Hybrid Regularization", IEEE TRANSACTIONS ON IMAGE PROCESSING, vol. 20, 2011, pages 2450 - 2462, XP011480592, DOI: doi:10.1109/TIP.2011.2128335
• S. SETZER; G. STEIDL; T. TEUBER: "Deblurring Poissonian Images by Split Bregman Techniques", JOURNAL OF VISUAL COMMUNICATION AND IMAGE REPRESENTATION, vol. 21, 2010, pages 193 - 199

Citation (search report)
• [A] DAVID GUILLAUME ET AL: "Time domain compressive beam forming of ultrasound signals", THE JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA, AMERICAN INSTITUTE OF PHYSICS FOR THE ACOUSTICAL SOCIETY OF AMERICA, NEW YORK, NY, US, vol. 137, no. 5, 1 May 2015 (2015-05-01), pages 2773 - 2784, XP012197604, ISSN: 0001-4966, DOI: 10.1121/1.4919302
• [A] AMIT ADAM ET AL: "Bayesian Time-of-Flight for Realtime Shape, Illumination and Albedo", 22 July 2015 (2015-07-22), XP055281485, Retrieved from the Internet <URL:http://de.arxiv.org/pdf/1507.06173> DOI: 10.1109/TPAMI.2016.2567379

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